SEQUENCE LISTING

<110> STOCKER, PENNY J.
      STEIMEL-CRESPI, DOROTHY T.
      CRESPI, CHARLES L.

<120> P-GLYCOPROTEINS AND USES THEREOF

<130> G00307.70020.US

<150> US 60/156,921
<151> 1999-09-28

<150> US 60/158,818
<151> 1999-10-12

<150> US 09/672,810
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                                             Met Asp Leu Glu Gly
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gac cgc aat gga gga gca gag aag aag aac ttt ttt aaa ctg aac aat       162
Asp Arg Asn Gly Gly Ala Glu Lys Lys Asn Phe Phe Lys Leu Asn Asn
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aaa agt aaa aaa gat aag aag gaa agg aaa cca act gtc agt gta ttt       210
Lys Ser Lys Lys Asp Lys Lys Glu Arg Lys Pro Thr Val Ser Val Phe
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tca atg ttt cgc tat tca aat tgg ctt gac aag ttg tat atg gtg gtg      258
Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys Leu Tyr Met Val Val
            40                  45                  50

gga act ttg gct gcc atc atc cat gga gct gga ctt cct ctc atg atg      306
Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly Leu Pro Leu Met Met
        55                  60                  65

ctg gtg ttt gga gac atg acg gat acc ttt gca aat gca gga aat tta      354
Leu Val Phe Gly Asp Met Thr Asp Thr Phe Ala Asn Ala Gly Asn Leu
70                  75                  80                  85
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      gga gat tta gga gct ctg ttg act aat agc agt aat atc act gat aca        402
      Gly Asp Leu Gly Ala Leu Leu Thr Asn Ser Ser Asn Ile Thr Asp Thr
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      gtg ccc gtc atg aat ctg gag gaa gat atg acc agg tat gcc tat tat        450
      Val Pro Val Met Asn Leu Glu Glu Asp Met Thr Arg Tyr Ala Tyr Tyr
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      tac agt gga att ggt gct ggg gtg ctg gtt gct gct tac att cag gtt        498
      Tyr Ser Gly Ile Gly Ala Gly Val Leu Val Ala Ala Tyr Ile Gln Val
                  120                 125                 130
 15
      tca ttt tgg tgc ctg gca gct gga aga caa ata cac aaa att aga aaa        546
      Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile His Lys Ile Arg Lys
                  135                 140                 145
      cag ttt ttt cat gct ata atg cga cag gag ata ggc tgg ttt gat gtg        594
      Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile Gly Trp Phe Asp Val
 20   150                 155                 160                 165
      cac gat gtt ggg gag ctt aac acc cgg ctt aca gat gat gtc tcc aag        642
      His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr Asp Asp Val Ser Lys
                      170                 175                 180
 25
      att aat gaa gga att ggt gac aaa att gga atg ttc ttt cag tca atg        690
      Ile Asn Glu Gly Ile Gly Asp Lys Ile Gly Met Phe Phe Gln Ser Met
                      185                 190                 195
 30   gca aca ttt ttc act ggg ttt ata gta gga ttt aca cgt ggt tgg aag        738
      Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe Thr Arg Gly Trp Lys
                  200                 205                 210
      cta acc ctt gtg att ttg gcc atc agt cct gtt ctt gga ctg tca gct        786
 35 . Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val Leu Gly Leu Ser Ala
                  215                 220                 225
      gca gtc tgg gca aag ata ctg tct tca ttt act gat aaa gaa ctc tta        834
      Ala Val Trp Ala Lys Ile Leu Ser Ser Phe Thr Asp Lys Glu Leu Leu
 40   230                 235                 240                 245
      gct tat gca aaa gct gga gca gta gct gaa gag gtc ttg gca gca att        882
      Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ala Ala Ile
                      250                 255                 260
 45
      aga act gtg att gca ttt gga gga caa aag aaa gaa ctc gaa agg tac        930
      Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys Glu Leu Glu Arg Tyr
                      265                 270                 275
 50   aac aaa aat tta gaa gaa gct aaa aga att ggg ata aag aaa gct att        978
      Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly Ile Lys Lys Ala Ile
                      280                 285                 290
      aca gcc aat att tct ata ggt gct gct ttc ctg ctt atc tat gca tct       1026
      Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu Leu Ile Tyr Ala Ser
                  295                 300                 305
      tat gct ctg gcc ttc tgg tat ggg acc acc ttg gtc ctc tca aag gaa       1074
      Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu Val Leu Ser Lys Glu
 60   310                 315                 320                 325
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        tat tct att gga caa gta ctc act gta ttc ttt tct gta tta att ggg    1122
        Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Phe Ser Val Leu Ile Gly
                    330                 335                 340
 5
        gct ttt agt gtt gga cag gca tct cca agc att gaa gca ttt gca aat    1170
        Ala Phe Ser Val Gly Gln Ala Ser Pro Ser Ile Glu Ala Phe Ala Asn
                    345                 350                 355
10
        gca aga gga gca gct ttt gaa atc ttc aag ata att gat aat aag cca    1218
        Ala Arg Gly Ala Ala Phe Glu Ile Phe Lys Ile Ile Asp Asn Lys Pro
                    360                 365                 370

        agt att gac agc tat tcg aag agt ggg cac aaa cca gat aat att aag    1266
15      Ser Ile Asp Ser Tyr Ser Lys Ser Gly His Lys Pro Asp Asn Ile Lys
                    375                 380                 385

        gga aat ttg gaa ttc aga aat gtt cac ttc agt tac cca tct cga aaa    1314
        Gly Asn Leu Glu Phe Arg Asn Val His Phe Ser Tyr Pro Ser Arg Lys
20      390                 395                 400                 405

        gaa gtt aag atc ttg aag ggc ctg aac ctg aag gtg cag agt ggg cag    1362
        Glu Val Lys Ile Leu Lys Gly Leu Asn Leu Lys Val Gln Ser Gly Gln
                    410                 415                 420
25
        acg gtg gcc ctg gtt gga aac agc ggc tgt ggg aag agc aca acg gtc    1410
        Thr Val Ala Leu Val Gly Asn Ser Gly Cys Gly Lys Ser Thr Thr Val
                    425                 430                 435

30      cag ctg atg cag agg ctt tat gac ccc aca gag ggc atg gtc agt gtt    1458
        Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu Gly Met Val Ser Val
                    440                 445                 450

        gat gga cag gat att agg acc ata aac gta agg ttt cta cgg gaa atc    1506
35      Asp Gly Gln Asp Ile Arg Thr Ile Asn Val Arg Phe Leu Arg Glu Ile
                    455                 460                 465

        atc ggt gtg gtg agt cag gaa cct gta ttg ttt gcc acc acg ata gct    1554
        Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Ala Thr Thr Ile Ala
40      470                 475                 480                 485

        gaa aac att cgc tat ggt cgt gaa gat gtc acc atg gat gag att gag    1602
        Glu Asn Ile Arg Tyr Gly Arg Glu Asp Val Thr Met Asp Glu Ile Glu
                    490                 495                 500
45
        aaa gct gtc aag gaa gcc aat gcc tat gac ttt atc atg aaa ctg cct    1650
        Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe Ile Met Lys Leu Pro
                    505                 510                 515

50      cag aaa ttt gac acc ctg gtt gga gag aga ggg gcc cag ctg agt ggt    1698
        Gln Lys Phe Asp Thr Leu Val Gly Glu Arg Gly Ala Gln Leu Ser Gly
                    520                 525                 530

        ggg cag aag cag agg atc gcc att gca cgt gcc ctg gtt cgc aac ccc    1746
55      Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro
                    535                 540                 545

        aag atc ctc ctg ctg gac gag gcc acg tca gcc ttg gac aca gaa agt    1794
        Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser
60      550                 555                 560                 565
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gaa gca gtg gtt cag gtg gct ctg gat aag gcc aga aaa ggt cgg acc    1842
Glu Ala Val Val Gln Val Ala Leu Asp Lys Ala Arg Lys Gly Arg Thr
            570             575                 580

acc att gtg ata gct cat cgt ttg tct acg gtt cgt aat gcc gac gtc    1890
Thr Ile Val Ile Ala His Arg Leu Ser Thr Val Arg Asn Ala Asp Val
            585             590                 595

atc gct ggt ttc gat gat gga gtc att gtg gag aaa gga aat cat gat    1938
Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu Lys Gly Asn His Asp
            600             605                 610

gag ctc atg aaa gag aaa ggc att tac ttc aaa ctt gtc aca atg cag    1986
Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys Leu Val Thr Met Gln
            615             620                 625

aca gca gga aat gaa att gaa tta gaa aat gca gct gat gaa tcc aaa    2034
Thr Ala Gly Asn Glu Ile Glu Leu Glu Asn Ala Ala Asp Glu Ser Lys
630             635                 640                 645

agt gaa att gat acc ttg gaa atg tct tca cat gat tca gga tcc agt    2082
Ser Glu Ile Asp Thr Leu Glu Met Ser Ser His Asp Ser Gly Ser Ser
            650             655                 660

cta ata aga aaa aga tcc act cgt agg agt gtc cgt gga tca caa ggc    2130
Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val Arg Gly Ser Gln Gly
            665             670                 675

caa gac aga aag ctt agt acc aaa gag gct ctg gat gaa agt ata cct    2178
Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu Asp Glu Ser Ile Pro
            680             685                 690

cca gtt tcc ttt tgg agg att atg aag cta aat tta act gag tgg cct    2226
Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn Leu Thr Glu Trp Pro
            695             700                 705

tat ttt gtt gtt ggt gta ttt tgt gcc att ata aat gga ggt ctg caa    2274
Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile Asn Gly Gly Leu Gln
710             715                 720                 725

cca gca ttt gca gta ata ttt tca aag att ata ggg att ttt aca aga    2322
Pro Ala Phe Ala Val Ile Phe Ser Lys Ile Ile Gly Ile Phe Thr Arg
            730             735                 740

aat gat gat gcc gaa aca aaa cga cag aat agt aac ttg ttt tca cta    2370
Asn Asp Asp Ala Glu Thr Lys Arg Gln Asn Ser Asn Leu Phe Ser Leu
            745             750                 755

ttg ttt cta gtc ctt gga att gtt tct ttt att aca ttt ttc ctt cag    2418
Leu Phe Leu Val Leu Gly Ile Val Ser Phe Ile Thr Phe Phe Leu Gln
            760             765                 770

ggc ttc aca ttt ggc aaa gct gga gag atc ctc acc aag cgg ctc cga    2466
Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu Thr Lys Arg Leu Arg
            775             780                 785

tac atg gtt ttc cga tcc atg ctc aga cag gat gtg agc tgg ttt gat    2514
Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp Val Ser Trp Phe Asp
            790             795                 800                 805
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gac cct aaa aac acc act gga gca ttg act acc agg ctc gcc aat gat    2562
Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr Arg Leu Ala Asn Asp
            810                 815                 820

gct gct caa gtt aaa ggg gct ata ggt tcc agg ctt gct ata att acc    2610
Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg Leu Ala Ile Ile Thr
            825                 830                 835

cag aat ata gca aat ctt ggg aca gga ata att ata tcc tta atc tat    2658
Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile Ile Ser Leu Ile Tyr
            840                 845                 850

ggt tgg caa ctg aca ctg tta ctc tta gca att gta ccc atc att gca    2706
Gly Trp Gln Leu Thr Leu Leu Leu Leu Ala Ile Val Pro Ile Ile Ala
            855                 860                 865

ata gca gga gtt gtt gaa atg aaa atg ttg tct gga caa gca ctg aaa    2754
Ile Ala Gly Val Val Glu Met Lys Met Leu Ser Gly Gln Ala Leu Lys
870                 875                 880                 885

gat aag aaa gaa cta gaa ggt gct ggg aag atc gct act gaa gca ata    2802
Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys Ile Ala Thr Glu Ala Ile
            890                 895                 900

gaa aac ttc cga act gtt gtt tct ttg act cag gag cag aag ttt gaa    2850
Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln Glu Gln Lys Phe Glu
            905                 910                 915

cat atg tat gat cag agt ttg cag gta cca tac aga aac tct ttg agg    2898
His Met Tyr Asp Gln Ser Leu Gln Val Pro Tyr Arg Asn Ser Leu Arg
            920                 925                 930

aaa gca cac atc ttt gga atc acg ttt tcc ttc acg cag gca atg atg    2946
Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe Thr Gln Ala Met Met
            935                 940                 945

tat ttt tcc tat gct gga tgt ttc cgg ttt gga gcc tac ttg gtg gca    2994
Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly Ala Tyr Leu Val Ala
950                 955                 960                 965

cat agt ctc atg agc ttt gag gat gtt ctg tta gta ttt tca gct gtt    3042
His Ser Leu Met Ser Phe Glu Asp Val Leu Leu Val Phe Ser Ala Val
            970                 975                 980

gtc ttt ggt gcc atg gcc gtg ggg caa gtc agt tca ttt gct cct gac    3090
Val Phe Gly Ala Met Ala Val Gly Gln Val Ser Ser Phe Ala Pro Asp
            985                 990                 995

tat gcc aaa gcc aaa gta tca gca gcc cac atc atc atg atc att gaa    3138
Tyr Ala Lys Ala Lys Val Ser Ala Ala His Ile Ile Met Ile Ile Glu
            1000                1005                1010

aaa acc cct ttg att gac agc tac agc aca gaa ggc cta aag ccg aac    3186
Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu Gly Leu Lys Pro Asn
            1015                1020                1025

aca ttg gaa gga aat gtc aca ttt aat gaa gtt gta ttc aac tat ccc    3234
Thr Leu Glu Gly Asn Val Thr Phe Asn Glu Val Val Phe Asn Tyr Pro
030                 1035                1040                1045
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acc cga ctg gac atc cca gtg ctt cag ggg ctg agc ctg gaa gtg aag    3282
Thr Arg Leu Asp Ile Pro Val Leu Gln Gly Leu Ser Leu Glu Val Lys
            1050                1055                1060

aag ggc cag acg ctg gcc ctg gtg ggc agc agt ggc tgt ggg aag agc    3330
Lys Gly Gln Thr Leu Ala Leu Val Gly Ser Ser Gly Cys Gly Lys Ser
        1065                1070                1075

acg gtg gtc cag ctc ctg gag cgg ttc tat gac ccc ttg gcg ggg aaa    3378
Thr Val Val Gln Leu Leu Glu Arg Phe Tyr Asp Pro Leu Ala Gly Lys
        1080                1085                1090

gtg ctg ctt gac ggc aaa gaa ata aag caa ctg aat gtt cag tgg ctc    3426
Val Leu Leu Asp Gly Lys Glu Ile Lys Gln Leu Asn Val Gln Trp Leu
    1095                1100                1105

cga gca cac ctg ggc atc gtg tcc cag gag ccc atc ctg ttt gac tgc    3474
Arg Ala His Leu Gly Ile Val Ser Gln Glu Pro Ile Leu Phe Asp Cys
110                 1115                1120                1125

agc att agt gag aac att gcc tat gga gac aac agc cgg gtg gtg tca    3522
Ser Ile Ser Glu Asn Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Ser
            1130                1135                1140

cag gaa gag atc gtg agg gca gcc aag gag gcc aat ata cac gcc ttc    3570
Gln Glu Glu Ile Val Arg Ala Ala Lys Glu Ala Asn Ile His Ala Phe
            1145                1150                1155

atc gag tca ctg cct aat aaa tat agc acc aga gta gga gac aaa gga    3618
Ile Glu Ser Leu Pro Asn Lys Tyr Ser Thr Arg Val Gly Asp Lys Gly
        1160                1165                1170

act cag ctc tct ggt ggc cag aaa caa cgc att gcc ata gct cgt gcc    3666
Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala
    1175                1180                1185

ctt gtt aga cag cct cat att ttg ctt ttg gat gaa gcc aca tca gct    3714
Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala
190                 1195                1200                1205

ctg gat aca gaa agt gaa aag gtt gtc caa gaa gcc ctg gac aaa gcc    3762
Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu Ala Leu Asp Lys Ala
            1210                1215                1220

aga gaa ggc cgt acc tgc att gtg att gct cac cgc ctg tcc acc atc    3810
Arg Glu Gly Arg Thr Cys Ile Val Ile Ala His Arg Leu Ser Thr Ile
            1225                1230                1235

cag aat gca gac tta ata gtg gtg ttt cag aat ggc aga gtc aag gag    3858
Gln Asn Ala Asp Leu Ile Val Val Phe Gln Asn Gly Arg Val Lys Glu
        1240                1245                1250

cac ggc aca cat cag cag ctg ctg gca cag aaa ggc atc tat ttt tca    3906
His Gly Thr His Gln Gln Leu Leu Ala Gln Lys Gly Ile Tyr Phe Ser
    1255                1260                1265

atg gtc agt gtc cag gct gga gca aag cgc cag t gaactgtgac          3950
Met Val Ser Val Gln Ala Gly Ala Lys Arg Gln
270                 1275                1280
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tgtatgagat gttaaatatt ttttaatatt tgtgtttaaa tatggcattt attcaaagtt    4010
aaaaagcaag tacttataga attatgaaga gttatctgtt taacatttcc tcaaccaagt    4070
tcagagtctt cagacactcg taattaaagg aagagagcga gagacatcat caagtggaga    4130
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            20                  25                  30
Thr Val Ser Val Phe Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys
        35                  40                  45
Leu Tyr Met Val Val Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly
        50                  55                  60
Leu Pro Leu Met Met Leu Val Phe Gly Asp Met Thr Asp Thr Phe Ala
65                  70                  75                  80
Asn Ala Gly Asn Leu Gly Asp Leu Gly Ala Leu Leu Thr Asn Ser Ser
                85                  90                  95
Asn Ile Thr Asp Thr Val Pro Val Met Asn Leu Glu Glu Asp Met Thr
            100                 105                 110
Arg Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val Ala
        115                 120                 125
Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile
        130                 135                 140
His Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile
145                 150                 155                 160
Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr
                165                 170                 175
Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile Gly Met
            180                 185                 190
Phe Phe Gln Ser Met Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe
        195                 200                 205
Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val
        210                 215                 220
Leu Gly Leu Ser Ala Ala Val Trp Ala Lys Ile Leu Ser Ser Phe Thr
225                 230                 235                 240
Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu
                245                 250                 255
Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys
            260                 265                 270
Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly
        275                 280                 285
Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu
        290                 295                 300
Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu
305                 310                 315                 320
Val Leu Ser Lys Glu Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Phe
                325                 330                 335
Ser Val Leu Ile Gly Ala Phe Ser Val Gly Gln Ala Ser Pro Ser Ile
            340                 345                 350
Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Phe Glu Ile Phe Lys Ile
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Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly His Lys
        370                 375                 380
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    Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Arg Asn Val His Phe Ser
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    Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn Leu Lys
                405                 410                 415
 5  Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly Cys Gly
                420                 425                 430
    Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu
            435                 440                 445
    Gly Met Val Ser Val Asp Gly Gln Asp Ile Arg Thr Ile Asn Val Arg
10      450                 455                 460
    Phe Leu Arg Glu Ile Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe
    465                 470                 475                 480
    Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asp Val Thr
                485                 490                 495
15  Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe
                500                 505                 510
    Ile Met Lys Leu Pro Gln Lys Phe Asp Thr Leu Val Gly Glu Arg Gly
            515                 520                 525
    Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala
20      530                 535                 540
    Leu Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala
    545                 550                 555                 560
    Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp Lys Ala
                565                 570                 575
25  Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr Val
                580                 585                 590
    Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu
                595                 600                 605
    Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys
30      610                 615                 620
    Leu Val Thr Met Gln Thr Ala Gly Asn Glu Ile Glu Leu Glu Asn Ala
    625                 630                 635                 640
    Ala Asp Glu Ser Lys Ser Glu Ile Asp Thr Leu Glu Met Ser Ser His
                645                 650                 655
35  Asp Ser Gly Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val
                660                 665                 670
    Arg Gly Ser Gln Gly Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu
            675                 680                 685
    Asp Glu Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn
40      690                 695                 700
    Leu Thr Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile
    705                 710                 715                 720
    Asn Gly Gly Leu Gln Pro Ala Phe Ala Val Ile Phe Ser Lys Ile Ile
                725                 730                 735
45  Gly Ile Phe Thr Arg Asn Asp Asp Ala Glu Thr Lys Arg Gln Asn Ser
                740                 745                 750
    Asn Leu Phe Ser Leu Leu Phe Leu Val Leu Gly Ile Val Ser Phe Ile
                755                 760                 765
    Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu
50      770                 775                 780
    Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp
    785                 790                 795                 800
    Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr
                805                 810                 815
55  Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg
                820                 825                 830
    Leu Ala Ile Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile
            835                 840                 845
    Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Leu Ala Ile
60      850                 855                 860
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Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu Ser
 865               870                 875                 880
Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys Ile
             885                 890                 895
Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln
         900                 905                 910
Glu Gln Lys Phe Glu His Met Tyr Asp Gln Ser Leu Gln Val Pro Tyr
         915                 920                 925
Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe
     930                 935                 940
Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly
945                 950                 955                 960
Ala Tyr Leu Val Ala His Ser Leu Met Ser Phe Glu Asp Val Leu Leu
             965                 970                 975
Val Phe Ser Ala Val Val Phe Gly Ala Met Ala Val Gly Gln Val Ser
             980                 985                 990
Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala His Ile
         995                 1000                1005
Ile Met Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu
     1010                1015                1020
Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn Glu Val
1025                1030                1035                1040
Val Phe Asn Tyr Pro Thr Arg Leu Asp Ile Pro Val Leu Gln Gly Leu
             1045                1050                1055
Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser Ser
             1060                1065                1070
Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr Asp
     1075                1080                1085
Pro Leu Ala Gly Lys Val Leu Leu Asp Gly Lys Glu Ile Lys Gln Leu
     1090                1095                1100
Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu Pro
1105                1110                1115                1120
Ile Leu Phe Asp Cys Ser Ile Ser Glu Asn Ile Ala Tyr Gly Asp Asn
             1125                1130                1135
Ser Arg Val Val Ser Gln Glu Glu Ile Val Arg Ala Ala Lys Glu Ala
             1140                1145                1150
Asn Ile His Ala Phe Ile Glu Ser Leu Pro Asn Lys Tyr Ser Thr Arg
             1155                1160                1165
Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile
     1170                1175                1180
Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp
1185                1190                1195                1200
Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu
             1205                1210                1215
Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala His
         1220                1225                1230
Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln Asn
     1235                1240                1245
Gly Arg Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln Lys
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                                             Met Asp Leu Glu Gly
                                              1               5

gac cgc aat gga gga gca gag aag aag aac ttt ttt aaa ctg aac aat        162
Asp Arg Asn Gly Gly Ala Glu Lys Lys Asn Phe Phe Lys Leu Asn Asn
             10               15                  20

aaa agt aaa aaa gat aag aag gaa agg aaa cca act gtc agt gta ttt        210
Lys Ser Lys Lys Asp Lys Lys Glu Arg Lys Pro Thr Val Ser Val Phe
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tca atg ttt cgc tat tca aat tgg ctt gac aag ttg tat atg gtg gtg        258
Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys Leu Tyr Met Val Val
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gga act ttg gct gcc atc atc cat gga gct gga ctt cct ctc atg atg        306
Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly Leu Pro Leu Met Met
     55               60               65

ctg gtg ttt gga gac atg acg gat acc ttt gca aat gca gga aat tta        354
Leu Val Phe Gly Asp Met Thr Asp Thr Phe Ala Asn Ala Gly Asn Leu
 70               75               80               85

gga gat tta gga gct ctg ttg ttt aac aac act aat agc agt aat atc        402
Gly Asp Leu Gly Ala Leu Leu Phe Asn Asn Thr Asn Ser Ser Asn Ile
             90               95               100

act gat aca gtg ccc gtc atg aat ctg gag gaa gat atg acc agg tat        450
Thr Asp Thr Val Pro Val Met Asn Leu Glu Glu Asp Met Thr Arg Tyr
             105              110              115

gcc tat tat tac agt gga att ggt gct ggg gtg ctg gtt gct gct tac        498
Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val Ala Ala Tyr
         120              125              130

att cag gtt tca ttt tgg tgc ctg gca gct gga aga caa ata cac aaa        546
Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile His Lys
     135              140              145

att aga aaa cag ttt ttt cat gct ata atg cga cag gag ata ggc tgg        594
Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile Gly Trp
150              155              160              165

ttt gat gtg cac gat gtt ggg gag ctt aac acc cgg ctt aca gat gat        642
Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr Asp Asp
             170              175              180

gtc tcc aag att aat gaa gga att ggt gac aaa att gga atg ttc ttt        690
Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile Gly Met Phe Phe
             185              190              195

cag tca atg gca aca ttt ttc act ggg ttt ata gta gga ttt aca cgt        738
Gln Ser Met Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe Thr Arg
     200              205              210
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    ggt tgg aag cta acc ctt gtg att ttg gcc atc agt cct gtt ctt gga        786
    Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val Leu Gly
        215             220             225

5   ctg tca gct gca gtc tgg gca aag ata ctg tct tca ttt act gat aaa        834
    Leu Ser Ala Ala Val Trp Ala Lys Ile Leu Ser Ser Phe Thr Asp Lys
    230             235             240             245

10  gaa ctc tta gct tat gca aaa gct gga gca gta gct gaa gag gtc ttg        882
    Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu Val Leu
                250             255             260

    gca gca att aga act gtg att gca ttt gga gga caa aag aaa gaa ctc        930
    Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys Glu Leu
15              265             270             275

    gaa agg tac aac aaa aat tta gaa gaa gct aaa aga att ggg ata aag        978
    Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly Ile Lys
                280             285             290
20
    aaa gct att aca gcc aat att tct ata ggt gct gct ttc ctg ctt atc       1026
    Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu Leu Ile
        295             300             305

25  tat gca tct tat gct ctg gcc ttc tgg tat ggg acc acc ttg gtc ctc       1074
    Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu Val Leu
    310             315             320             325

30  tca aag gaa tat tct att gga caa gta ctc act gta ttc ttt tct gta       1122
    Ser Lys Glu Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Phe Ser Val
                330             335             340

    tta att ggg gct ttt agt gtt gga cag gca tct cca agc att gaa gca       1170
    Leu Ile Gly Ala Phe Ser Val Gly Gln Ala Ser Pro Ser Ile Glu Ala
35              345             350             355

    ttt gca aat gca aga gga gca gct ttt gaa atc ttc aag ata att gat       1218
    Phe Ala Asn Ala Arg Gly Ala Ala Phe Glu Ile Phe Lys Ile Ile Asp
        360             365             370
40
    aat aag cca agt att gac agc tat tcg aag agt ggg cac aaa cca gat       1266
    Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly His Lys Pro Asp
        375             380             385

45  aat att aag gga aat ttg gaa ttc aga aat gtt cac ttc agt tac cca       1314
    Asn Ile Lys Gly Asn Leu Glu Phe Arg Asn Val His Phe Ser Tyr Pro
    390             395             400             405

50  tct cga aaa gaa gtt aag atc ttg aag ggc ctg aac ctg aag gtg cag       1362
    Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn Leu Lys Val Gln
                410             415             420

    agt ggg cag acg gtg gcc ctg gtt gga aac agc ggc tgt ggg aag agc       1410
    Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly Cys Gly Lys Ser
55              425             430             435

    aca acg gtc cag ctg atg cag agg ctt tat gac ccc aca gag ggc atg       1458
    Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu Gly Met
                440             445             450
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gtc agt gtt gat gga cag gat att agg acc ata aac gta agg ttt cta   1506
Val Ser Val Asp Gly Gln Asp Ile Arg Thr Ile Asn Val Arg Phe Leu
    455   460   465

5 cgg gaa atc atc ggt gtg gtg agt cag gaa cct gta ttg ttt gcc acc   1554
Arg Glu Ile Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Ala Thr
470   475   480   485

10 acg ata gct gaa aac att cgc tat ggt cgt gaa gat gtc acc atg gat   1602
Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asp Val Thr Met Asp
          490   495   500

gag att gag aaa gct gtc aag gaa gcc aat gcc tat gac ttt atc atg   1650
Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe Ile Met
15   505   510   515

aaa ctg cct cag aaa ttt gac acc ctg gtt gga gag aga ggg gcc cag   1698
Lys Leu Pro Gln Lys Phe Asp Thr Leu Val Gly Glu Arg Gly Ala Gln
      520   525   530
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ctg agt ggt ggg cag aag cag agg atc gcc att gca cgt gcc ctg gtt   1746
Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val
     535   540   545

25 cgc aac ccc aag atc ctc ctg ctg gac gag gcc acg tca gcc ttg gac   1794
Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp
550   555   560   565

aca gaa agt gaa gca gtg gtt cag gtg gct ctg gat aag gcc aga aaa   1842
Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp Lys Ala Arg Lys
30   570   575   580

ggt cgg acc acc att gtg ata gct cat cgt ttg tct acg gtt cgt aat   1890
Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr Val Arg Asn
35   585   590   595

gcc gac gtc atc gct ggt ttc gat gat gga gtc att gtg gag aaa gga   1938
Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu Lys Gly
      600   605   610
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aat cat gat gag ctc atg aaa gag aaa ggc att tac ttc aaa ctt gtc   1986
Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys Leu Val
      615   620   625

45 aca atg cag aca gca gga aat gaa att gaa tta gaa aat gca gct gat   2034
Thr Met Gln Thr Ala Gly Asn Glu Ile Glu Leu Glu Asn Ala Ala Asp
630   635   640   645

gaa tcc aaa agt gaa att gat acc ttg gaa atg tct tca cat gat tca   2082
Glu Ser Lys Ser Glu Ile Asp Thr Leu Glu Met Ser Ser His Asp Ser
50   650   655   660

gga tcc agt cta ata aga aaa aga tcc act cgt agg agt gtc cgt gga   2130
Gly Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val Arg Gly
55   665   670   675

tca caa ggc caa gac aga aag ctt agt acc aaa gag gct ctg gat gaa   2178
Ser Gln Gly Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu Asp Glu
      680   685   690
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agt ata cct cca gtt tcc ttt tgg agg att atg aag cta aat tta act     2226
Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn Leu Thr
    695             700             705

gag tgg cct tat ttt gtt gtt ggt gta ttt tgt gcc att ata aat gga     2274
Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile Asn Gly
710             715             720             725

ggt ctg caa cca gca ttt gca gta ata ttt tca aag att ata ggg att     2322
Gly Leu Gln Pro Ala Phe Ala Val Ile Phe Ser Lys Ile Ile Gly Ile
                730             735             740

ttt aca aga aat gat gat gcc gaa aca aaa cga cag aat agt aac ttg     2370
Phe Thr Arg Asn Asp Asp Ala Glu Thr Lys Arg Gln Asn Ser Asn Leu
            745             750             755

ttt tca cta ttg ttt cta gtc ctt gga att gtt tct ttt att aca ttt     2418
Phe Ser Leu Leu Phe Leu Val Leu Gly Ile Val Ser Phe Ile Thr Phe
        760             765             770

ttc ctt cag ggc ttc aca ttt ggc aaa gct gga gag atc ctc acc aag     2466
Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu Thr Lys
    775             780             785

cgg ctc cga tac atg gtt ttc cga tcc atg ctc aga cag gat gtg agc     2514
Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp Val Ser
790             795             800             805

tgg ttt gat gac cct aaa aac acc act gga gca ttg act acc agg ctc     2562
Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr Arg Leu
            810             815             820

gcc aat gat gct gct caa gtt aaa ggg gct ata ggt tcc agg ctt gct     2610
Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg Leu Ala
            825             830             835

ata att acc cag aat ata gca aat ctt ggg aca gga ata att ata tcc     2658
Ile Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile Ile Ser
        840             845             850

tta atc tat ggt tgg caa ctg aca ctg tta ctc tta gca att gta ccc     2706
Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Ala Ile Val Pro
    855             860             865

atc att gca ata gca gga gtt gtt gaa atg aaa atg ttg tct gga caa     2754
Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu Ser Gly Gln
870             875             880             885

gca ctg aaa gat aag aaa gaa cta gaa ggt gct ggg aag atc gct act     2802
Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys Ile Ala Thr
            890             895             900

gaa gca ata gaa aac ttc cga act gtt gtt tct ttg act cag gag cag     2850
Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln Glu Gln
            905             910             915

aag ttt gaa cat atg tat gat cag agt ttg cag gta cca tac aga aac     2898
Lys Phe Glu His Met Tyr Asp Gln Ser Leu Gln Val Pro Tyr Arg Asn
            920             925             930
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      tct ttg agg aaa gca cac atc ttt gga atc acg ttt tcc ttc acg cag    2946
      Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe Thr Gln
              935             940             945

  5   gca atg atg tat ttt tcc tat gct gga tgt ttc cgg ttt gga gcc tac    2994
      Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly Ala Tyr
      950             955             960             965

      ttg gtg gca cat agt ctc atg agc ttt gag gat gtt ctg tta gta ttt    3042
 10   Leu Val Ala His Ser Leu Met Ser Phe Glu Asp Val Leu Leu Val Phe
                  970             975             980

      tca gct gtt gtc ttt ggt gcc atg gcc gtg ggg caa gtc agt tca ttt    3090
 15   Ser Ala Val Val Phe Gly Ala Met Ala Val Gly Gln Val Ser Ser Phe
                  985             990             995

      gct cct gac tat gcc aaa gcc aaa gta tca gca gcc cac atc atc atg    3138
      Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala His Ile Ile Met
              1000            1005            1010
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      atc att gaa aaa acc cct ttg att gac agc tac agc aca gaa ggc cta    3186
      Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu Gly Leu
          1015            1020            1025

 25   aag ccg aac aca ttg gaa gga aat gtc aca ttt aat gaa gtt gta ttc    3234
      Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn Glu Val Val Phe
      030             1035            1040            1045

 30   aac tat ccc acc cga ctg gac atc cca gtg ctt cag ggg ctg agc ctg    3282
      Asn Tyr Pro Thr Arg Leu Asp Ile Pro Val Leu Gln Gly Leu Ser Leu
              1050            1055            1060

      gaa gtg aag aag ggc cag acg ctg gcc ctg gtg ggc agc agt ggc tgt    3330
 35   Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser Ser Gly Cys
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      ggg aag agc acg gtg gtc cag ctc ctg gag cgg ttc tat gac ccc ttg    3378
      Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr Asp Pro Leu
              1080            1085            1090
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      gcg ggg aaa gtg ctg ctt gac ggc aaa gaa ata aag caa ctg aat gtt    3426
      Ala Gly Lys Val Leu Leu Asp Gly Lys Glu Ile Lys Gln Leu Asn Val
          1095            1100            1105

 45   cag tgg ctc cga gca cac ctg ggc atc gtg tcc cag gag ccc atc ctg    3474
      Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu Pro Ile Leu
      110             1115            1120            1125

 50   ttt gac tgc agc att agt gag aac att gcc tat gga gac aac agc cgg    3522
      Phe Asp Cys Ser Ile Ser Glu Asn Ile Ala Tyr Gly Asp Asn Ser Arg
                  1130            1135            1140

      gtg gtg tca cag gaa gag atc gtg agg gca gcc aag gag gcc aat ata    3570
      Val Val Ser Gln Glu Glu Ile Val Arg Ala Ala Lys Glu Ala Asn Ile
                  1145            1150            1155
 55
      cac gcc ttc atc gag tca ctg cct aat aaa tat agc acc aga gta gga    3618
      His Ala Phe Ile Glu Ser Leu Pro Asn Lys Tyr Ser Thr Arg Val Gly
              1160            1165            1170
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gac aaa gga act cag ctc tct ggt ggc cag aaa caa cgc att gcc ata    3666
Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile
    1175                1180                1185


gct cgt gcc ctt gtt aga cag cct cat att ttg ctt ttg gat gaa gcc    3714
Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp Glu Ala
190             1195                1200                1205


aca tca gct ctg gat aca gaa agt gaa aag gtt gtc caa gaa gcc ctg    3762
Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu Ala Leu
            1210                1215                1220


gac aaa gcc aga gaa ggc cgt acc tgc att gtg att gct cac cgc ctg    3810
Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala His Arg Leu
            1225                1230                1235


tcc acc atc cag aat gca gac tta ata gtg gtg ttt cag aat ggc aga    3858
Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln Asn Gly Arg
        1240                1245                1250


gtc aag gag cac ggc aca cat cag cag ctg ctg gca cag aaa ggc atc    3906
Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln Lys Gly Ile
    1255                1260                1265


tat ttt tca atg gtc agt gtc cag gct gga gca aag cgc cag t          3949
Tyr Phe Ser Met Val Ser Val Gln Ala Gly Ala Lys Arg Gln
270             1275                1280


gaactgtgac tgtatgagat gttaaatatt ttttaatatt tgtgtttaaa tatggcattt    4009
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tcaaccaagt tcagagtctt cagacactcg taattaaagg aagagagcga gagacatcat    4129
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attttt


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Thr Val Ser Val Phe Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys
        35                  40                  45
Leu Tyr Met Val Val Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly
    50                  55                  60
Leu Pro Leu Met Met Leu Val Phe Gly Asp Met Thr Asp Thr Phe Ala
65                  70                  75                  80
Asn Ala Gly Asn Leu Gly Asp Leu Gly Ala Leu Leu Phe Asn Asn Thr
            85                  90                  95
Asn Ser Ser Asn Ile Thr Asp Thr Val Pro Val Met Asn Leu Glu Glu
            100                 105                 110
Asp Met Thr Arg Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val
    115                 120                 125
Leu Val Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly
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Arg Gln Ile His Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg
145                 150                 155                 160
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    Gln Glu Ile Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr
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    Arg Leu Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys
                180                 185                 190
 5  Ile Gly Met Phe Phe Gln Ser Met Ala Thr Phe Phe Thr Gly Phe Ile
                195                 200                 205
    Val Gly Phe Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile
            210                 215                 220
    Ser Pro Val Leu Gly Leu Ser Ala Ala Val Trp Ala Lys Ile Leu Ser
10  225                 230                 235                 240
    Ser Phe Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val
                245                 250                 255
    Ala Glu Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly
                260                 265                 270
15  Gln Lys Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys
                275                 280                 285
    Arg Ile Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala
            290                 295                 300
    Ala Phe Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly
20  305                 310                 315                 320
    Thr Thr Leu Val Leu Ser Lys Glu Tyr Ser Ile Gly Gln Val Leu Thr
                325                 330                 335
    Val Phe Phe Ser Val Leu Ile Gly Ala Phe Ser Val Gly Gln Ala Ser
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25  Pro Ser Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Phe Glu Ile
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    Phe Lys Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser
                370                 375                 380
    Gly His Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Arg Asn Val
30  385                 390                 395                 400
    His Phe Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu
                405                 410                 415
    Asn Leu Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser
                420                 425                 430
35  Gly Cys Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp
                435                 440                 445
    Pro Thr Glu Gly Met Val Ser Val Asp Gly Gln Asp Ile Arg Thr Ile
                450                 455                 460
    Asn Val Arg Phe Leu Arg Glu Ile Ile Gly Val Val Ser Gln Glu Pro
40  465                 470                 475                 480
    Val Leu Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu
                485                 490                 495
    Asp Val Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala
                500                 505                 510
45  Tyr Asp Phe Ile Met Lys Leu Pro Gln Lys Phe Asp Thr Leu Val Gly
                515                 520                 525
    Glu Arg Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile
                530                 535                 540
    Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala
50  545                 550                 555                 560
    Thr Ser Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu
                565                 570                 575
    Asp Lys Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu
                580                 585                 590
55  Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val
                595                 600                 605
    Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile
                610                 615                 620
    Tyr Phe Lys Leu Val Thr Met Gln Thr Ala Gly Asn Glu Ile Glu Leu
60  625                 630                 635                 640
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     Glu Asn Ala Ala Asp Glu Ser Lys Ser Glu Ile Asp Thr Leu Glu Met
                     645             650             655
     Ser Ser His Asp Ser Gly Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg
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     Glu Ala Leu Asp Glu Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met
         690             695             700
     Lys Leu Asn Leu Thr Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys
10   705             710             715             720
     Ala Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ala Val Ile Phe Ser
                 725             730             735
     Lys Ile Ile Gly Ile Phe Thr Arg Asn Asp Asp Ala Glu Thr Lys Arg
                 740             745             750
15   Gln Asn Ser Asn Leu Phe Ser Leu Leu Phe Leu Val Leu Gly Ile Val
                 755             760             765
     Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly
         770             775             780
     Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu
20   785             790             795             800
     Arg Gln Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala
                 805             810             815
     Leu Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile
                 820             825             830
25   Gly Ser Arg Leu Ala Ile Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr
             835             840             845
     Gly Ile Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu
             850             855             860
     Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys
30   865             870             875             880
     Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala
                 885             890             895
     Gly Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser
                 900             905             910
35   Leu Thr Gln Glu Gln Lys Phe Glu His Met Tyr Asp Gln Ser Leu Gln
             915             920             925
     Val Pro Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr
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     Phe Ser Phe Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe
40   945             950             955             960
     Arg Phe Gly Ala Tyr Leu Val Ala His Ser Leu Met Ser Phe Glu Asp
                 965             970             975
     Val Leu Leu Val Phe Ser Ala Val Val Phe Gly Ala Met Ala Val Gly
                 980             985             990
45   Gln Val Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala
             995             1000            1005
     Ala His Ile Ile Met Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr
         1010            1015            1020
     Ser Thr Glu Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe
50   1025            1030            1035            1040
     Asn Glu Val Val Phe Asn Tyr Pro Thr Arg Leu Asp Ile Pro Val Leu
                 1045            1050            1055
     Gln Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val
                 1060            1065            1070
55   Gly Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg
             1075            1080            1085
     Phe Tyr Asp Pro Leu Ala Gly Lys Val Leu Leu Asp Gly Lys Glu Ile
         1090            1095            1100
     Lys Gln Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser
60   1105            1110            1115            1120
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Gln Glu Pro Ile Leu Phe Asp Cys Ser Ile Ser Glu Asn Ile Ala Tyr
           1125   1130   1135

Gly Asp Asn Ser Arg Val Val Ser Gln Glu Glu Ile Val Arg Ala Ala
           1140   1145   1150

Lys Glu Ala Asn Ile His Ala Phe Ile Glu Ser Leu Pro Asn Lys Tyr
           1155   1160   1165

Ser Thr Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys
    1170   1175   1180

Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu
1185   1190   1195   1200

Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val
           1205   1210   1215

Val Gln Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val
           1220   1225   1230

Ile Ala His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val
          1235   1240   1245

Phe Gln Asn Gly Arg Val Lys Glu His Gly Thr His Gln Gln Leu Leu
1250   1255   1260

Ala Gln Lys Gly Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Ala
1265   1270   1275   1280

Lys Arg Gln

<210> 5
<211> 1280
<212> PRT
<213> Homo sapiens

<400> 5

Met Asp Leu Glu Gly Asp Arg Asn Gly Gly Ala Lys Lys Lys Asn Phe
1   5   10   15

Phe Lys Leu Asn Asn Lys Ser Glu Lys Asp Lys Lys Glu Lys Lys Pro
          20   25   30

Thr Val Ser Val Phe Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys
          35   40   45

Leu Tyr Met Val Val Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly
      50   55   60

Leu Pro Leu Met Met Leu Val Phe Gly Glu Met Thr Asp Ile Phe Ala
65   70   75   80

Asn Ala Gly Asn Leu Glu Asp Leu Met Ser Asn Ile Thr Asn Arg Ser
              85   90   95

Asp Ile Asn Asp Thr Gly Phe Phe Met Asn Leu Glu Glu Asp Met Thr
          100   105   110

Arg Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val Ala
      115   120   125

Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile
    130   135   140

His Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile
145   150   155   160

Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr
           165   170   175

Asp Asp Val Ser Lys Ile Asn Glu Val Ile Gly Asp Lys Ile Gly Met
          180   185   190

Phe Phe Gln Ser Met Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe
      195   200   205

Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val
    210   215   220

Leu Gly Leu Ser Ala Ala Val Trp Ala Lys Ile Leu Ser Ser Phe Thr
225   230   235   240

Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu

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                         245                    250                         255
           Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys
                         260                    265                    270
           Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly
    5                275                    280                    285
           Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu
               290                    295                    300
           Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu
           305                    310                    315                    320
    10     Val Leu Ser Gly Glu Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Phe
                         325                    330                    335
           Ser Val Leu Ile Gly Ala Phe Ser Val Gly Gln Ala Ser Pro Ser Ile
                         340                    345                    350
           Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe Lys Ile
    15                355                    360                    365
           Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly His Lys
               370                    375                    380
           Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Arg Asn Val His Phe Ser
           385                    390                    395                    400
    20     Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn Leu Lys
                         405                    410                    415
           Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly Cys Gly
                         420                    425                    430
           Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu
    25                435                    440                    445
           Gly Met Val Ser Val Asp Gly Gln Asp Ile Arg Thr Ile Asn Val Arg
               450                    455                    460
           Phe Leu Arg Glu Ile Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe
           465                    470                    475                    480
    30     Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn Val Thr
                         485                    490                    495
           Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe
                         500                    505                    510
           Ile Met Lys Leu Pro His Lys Phe Asp Thr Leu Val Gly Glu Arg Gly
    35                515                    520                    525
           Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala
               530                    535                    540
           Leu Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala
           545                    550                    555                    560
    40     Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp Lys Ala
                         565                    570                    575
           Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr Val
                         580                    585                    590
           Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu
    45                595                    600                    605
           Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys
               610                    615                    620
           Leu Val Thr Met Gln Thr Ala Gly Asn Glu Val Glu Leu Glu Asn Ala
           625                    630                    635                    640
    50     Ala Asp Glu Ser Lys Ser Glu Ile Asp Ala Leu Glu Met Ser Ser Asn
                         645                    650                    655
           Asp Ser Arg Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val
                         660                    665                    670
           Arg Gly Ser Gln Ala Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu
    55                675                    680                    685
           Asp Glu Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn
               690                    695                    700
           Leu Thr Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile
           705                    710                    715                    720
    60     Asn Gly Gly Leu Gln Pro Ala Phe Ala Ile Ile Phe Ser Lys Ile Ile
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                     725                    730                    735
      Gly Val Phe Thr Arg Ile Asp Asp Pro Glu Thr Lys Arg Gln Asn Ser
                 740                    745                    750
      Asn Leu Phe Ser Leu Leu Phe Leu Ala Leu Gly Ile Ile Ser Phe Ile
  5              755                    760                    765
      Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu
                 770                    775                    780
      Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp
      785                    790                    795                    800
 10   Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr
                 805                    810                    815
      Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg
                 820                    825                    830
      Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile
 15              835                    840                    845
      Ile Ser Phe Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Leu Ala Ile
                 850                    855                    860
      Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu Ser
      865                    870                    875                    880
 20   Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys Ile
                 885                    890                    895
      Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln
                 900                    905                    910
      Glu Gln Lys Phe Glu His Met Tyr Ala Gln Ser Leu Gln Val Pro Tyr
 25              915                    920                    925
      Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe
                 930                    935                    940
      Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly
      945                    950                    955                    960
 30   Ala Tyr Leu Val Ala His Lys Leu Met Ser Phe Glu Asp Val Leu Leu
                 965                    970                    975
      Val Phe Ser Ala Val Val Phe Gly Ala Met Ala Val Gly Gln Val Ser
                 980                    985                    990
      Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Ile Ser Ala Ala His Ile
 35              995                    1000                   1005
      Ile Met Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu
                 1010                   1015                   1020
      Gly Leu Met Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Gly Glu Val
      1025                   1030                   1035                   1040
 40   Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln Gly Leu
                 1045                   1050                   1055
      Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser Ser
                 1060                   1065                   1070
      Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr Asp
 45              1075                   1080                   1085
      Pro Leu Ala Gly Lys Val Leu Leu Asp Gly Lys Glu Ile Lys Arg Leu
                 1090                   1095                   1100
      Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu Pro
      1105                   1110                   1115                   1120
 50   Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp Asn
                 1125                   1130                   1135
      Ser Arg Val Val Ser Gln Glu Glu Ile Val Arg Ala Ala Lys Glu Ala
                 1140                   1145                   1150
      Asn Ile His Ala Phe Ile Glu Ser Leu Pro Asn Lys Tyr Ser Thr Lys
 55              1155                   1160                   1165
      Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile
                 1170                   1175                   1180
      Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp
      1185                   1190                   1195                   1200
 60   Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu
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                      1205                      1210                      1215
         Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala His
                      1220                      1225                      1230
         Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln Asn
   5             1235                      1240                      1245
         Gly Arg Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln Lys
             1250                      1255                      1260
         Gly Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Thr Lys Arg Gln
         1265                      1270                      1275              1280
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             <210> 6
             <211> 1279
             <212> PRT
             <213> Homo sapiens
  15
             <400> 6
         Met Asp Leu Glu Gly Asp Arg Asn Gly Gly Ala Lys Lys Lys Asn Phe
          1               5                  10                      15
         Phe Lys Leu Asn Asn Lys Ser Glu Lys Asp Lys Lys Glu Lys Lys Pro
  20             20                      25                      30
         Thr Val Ser Val Phe Ser Met Phe Arg Tyr Ser Asn Trp Leu Asp Lys
                 35                      40                      45
         Leu Tyr Met Val Val Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly
                 50                      55                      60
  25     Leu Pro Leu Met Met Leu Val Phe Gly Glu Met Thr Asp Ile Phe Ala
         65                      70                      75                      80
         Asn Ala Gly Asn Leu Glu Asp Leu Met Ser Asn Ile Thr Asn Arg Ser
                         85                      90                      95
         Asp Ile Asn Asp Thr Gly Phe Phe Met Asn Leu Glu Glu Asp Met Thr
  30                     100                     105                     110
         Arg Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val Ala
                     115                     120                     125
         Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile
                     130                     135                     140
  35     His Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile
         145                     150                     155                     160
         Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr
                         165                     170                     175
         Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile Gly Met
  40                     180                     185                     190
         Phe Phe Gln Ser Met Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe
                     195                     200                     205
         Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val
                     210                     215                     220
  45     Leu Gly Leu Ser Ala Ala Val Trp Ala Lys Ile Leu Ser Ser Phe Thr
         225                     230                     235                     240
         Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu
                     245                     250                     255
         Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys
  50                     260                     265                     270
         Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly
                     275                     280                     285
         Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu
                     290                     295                     300
  55     Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu
         305                     310                     315                     320
         Val Leu Ser Gly Glu Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Ser
                     325                     330                     335
         Val Leu Ile Gly Ala Phe Ser Val Gly Gln Ala Ser Pro Ser Ile Glu
  60                     340                     345                     350
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22

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    Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe Lys Ile Ile
            355                 360             365
    Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly His Lys Pro
            370             375             380
 5  Asp Asn Ile Lys Gly Asn Leu Glu Phe Arg Asn Val His Phe Ser Tyr
    385             390             395                     400
    Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn Leu Lys Val
                405             410                     415
    Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly Cys Gly Lys
10              420             425             430
    Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu Gly
            435             440             445
    Met Val Ser Val Asp Gly Gln Asp Ile Arg Thr Ile Asn Val Arg Phe
        450             455             460
15  Leu Arg Glu Ile Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Ala
    465             470             475                     480
    Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn Val Thr Met
                485             490                     495
    Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe Ile
20          500             505             510
    Met Lys Leu Pro His Lys Phe Asp Thr Leu Val Gly Glu Arg Gly Ala
        515             520             525
    Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu
        530             535             540
25  Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu
    545             550             555                     560
    Asp Thr Glu Ser Glu Ala Val Val Gln Ala Leu Asp Lys Ala Arg
                565             570             575
    Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr Val Arg
30              580             585             590
    Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu Lys
                595             600             605
    Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys Leu
            610             615             620
35  Val Thr Met Gln Thr Ala Gly Asn Glu Val Glu Leu Glu Asn Ala Ala
    625             630             635                     640
    Asp Glu Ser Lys Ser Glu Ile Asp Ala Leu Glu Met Ser Ser Asn Asp
                645             650                     655
    Ser Arg Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val Arg
40              660             665             670
    Gly Ser Gln Ala Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu Asp
            675             680             685
    Glu Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn Leu
        690             695             700
45  Thr Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile Asn
    705             710             715                     720
    Gly Gly Leu Gln Pro Ala Phe Ala Ile Ile Phe Ser Lys Ile Ile Gly
                725             730                     735
    Val Phe Thr Arg Ile Asp Asp Pro Glu Thr Lys Arg Gln Asn Ser Asn
50              740             745             750
    Leu Phe Ser Leu Leu Phe Leu Ala Leu Gly Ile Ile Ser Phe Ile Thr
            755             760             765
    Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu Thr
            770             775             780
55  Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp Val
    785             790             795                     800
    Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr Arg
                805             810                     815
    Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg Leu
60              820             825             830
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```
Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile Ile
        835                 840                 845
Ser Phe Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Leu Ala Ile Val
    850                 855                 860
Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu Ser Gly
865                 870                 875                 880
Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys Ile Ala
            885                 890                 895
Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln Glu
            900                 905                 910
Gln Lys Phe Glu His Met Tyr Ala Gln Ser Leu Gln Val Pro Tyr Arg
        915                 920                 925
Asn Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe Thr
    930                 935                 940
Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly Ala
945                 950                 955                 960
Tyr Leu Val Ala His Lys Leu Met Ser Phe Glu Asp Val Leu Leu Val
                965                 970                 975
Phe Ser Ala Val Val Phe Gly Ala Met Ala Val Gly Gln Val Ser Ser
            980                 985                 990
Phe Ala Pro Asp Tyr Ala Lys Ala Lys Ile Ser Ala Ala His Ile Ile
    995                 1000                1005
Met Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu Gly
    1010                1015                1020
Leu Met Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Gly Glu Val Val
1025                1030                1035                1040
Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln Gly Leu Ser
            1045                1050                1055
Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser Ser Gly
            1060                1065                1070
Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr Asp Pro
        1075                1080                1085
Leu Ala Gly Lys Val Leu Leu Asp Gly Lys Glu Ile Lys Arg Leu Asn
    1090                1095                1100
Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu Pro Ile
1105                1110                1115                1120
Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp Asn Ser
            1125                1130                1135
Arg Val Val Ser Gln Glu Glu Ile Val Arg Ala Ala Lys Glu Ala Asn
    1140                1145                1150
Ile His Ala Phe Ile Glu Ser Leu Pro Asn Lys Tyr Ser Thr Lys Val
    1155                1160                1165
Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala
    1170                1175                1180
Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp Glu
1185                1190                1195                1200
Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu Ala
            1205                1210                1215
Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala His Arg
        1220                1225                1230
Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln Asn Gly
        1235                1240                1245
Arg Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln Lys Gly
    1250                1255                1260
Ile Tyr Phe Ser Met Val Ser Val Gln Ala Gly Thr Lys Arg Gln
1265                1270                1275
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<210> 7
<211> 1280
<212> PRT
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<213> Canis familiaris

<400> 7

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Met Asp Pro Glu Gly Gly Arg Lys Gly Ser Ala Glu Lys Asn Phe Trp
1               5                   10                  15
Lys Met Gly Lys Lys Ser Lys Lys Glu Lys Lys Glu Lys Lys Pro Thr
            20                  25                  30
Val Ser Thr Phe Ala Met Phe Arg Tyr Ser Asn Trp Leu Asp Arg Leu
        35                  40                  45
Tyr Met Leu Val Gly Thr Met Ala Ala Ile Ile His Gly Ala Ala Leu
    50                  55                  60
Pro Leu Met Met Leu Val Phe Gly Asn Met Thr Asp Ser Phe Ala Asn
65                  70                  75                  80
Ala Gly Ile Ser Arg Asn Lys Thr Phe Pro Val Ile Ile Asn Glu Ser
            85                  90                  95
Ile Thr Asn Asn Thr Gln His Phe Ile Asn His Leu Glu Glu Glu Met
            100                 105                 110
Thr Thr Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val
        115                 120                 125
Ala Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln
    130                 135                 140
Ile Leu Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu
145                 150                 155                 160
Ile Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg Leu
            165                 170                 175
Thr Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Val Gly
            180                 185                 190
Met Phe Phe Gln Ser Ile Ala Thr Phe Phe Thr Gly Phe Ile Val Gly
        195                 200                 205
Phe Thr Pro Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser Pro
    210                 215                 220
Val Leu Gly Leu Ser Ala Ala Ile Trp Ala Lys Ile Leu Ser Ser Phe
225                 230                 235                 240
Thr Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu
            245                 250                 255
Glu Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln Lys
        260                 265                 270
Lys Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile
    275                 280                 285
Gly Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe
    290                 295                 300
Leu Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Ser
305                 310                 315                 320
Leu Val Leu Ser Ser Glu Tyr Thr Ile Gly Gln Val Leu Thr Val Phe
            325                 330                 335
Phe Ser Val Leu Ile Gly Ala Phe Ser Ile Gly Gln Ala Ser Pro Ser
            340                 345                 350
Ile Glu Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe Lys
    355                 360                 365
Ile Ile Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly His
    370                 375                 380
Lys Pro Asp Asn Ile Lys Gly Asn Leu Glu Phe Lys Asn Val His Phe
385                 390                 395                 400
Ser Tyr Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn Leu
            405                 410                 415
Lys Val Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly Cys
            420                 425                 430
Gly Lys Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr
        435                 440                 445
Asp Gly Met Val Cys Ile Asp Gly Gln Asp Ile Arg Thr Ile Asn Val
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            450                    455                    460
        Arg His Leu Arg Glu Ile Thr Gly Val Val Ser Gln Glu Pro Val Leu
        465                    470                    475                    480
        Phe Ala Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn Val
  5                         485                    490                    495
        Thr Met Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp
                            500                    505                    510
        Phe Ile Met Lys Leu Pro Asn Lys Phe Asp Thr Leu Val Gly Glu Arg
                            515                    520                    525
  10    Gly Ala Arg Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg
                            530                    535                    540
        Ala Leu Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser
        545                    550                    555                    560
        Ala Leu Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp Lys
  15                         565                    570                    575
        Ala Arg Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr
                            580                    585                    590
        Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val
                            595                    600                    605
  20    Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe
                            610                    615                    620
        Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Glu Leu Glu Asn
        625                    630                    635                    640
        Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met Ser Pro
  25                         645                    650                    655
        Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg Arg Ser
                            660                    665                    670
        Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys Glu Asp
                            675                    680                    685
  30    Leu Asn Glu Asn Val Pro Ser Val Ser Phe Trp Arg Ile Leu Lys Leu
                            690                    695                    700
        Asn Ser Thr Glu Trp Pro Tyr Phe Val Val Gly Ile Phe Cys Ala Ile
        705                    710                    715                    720
        Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser Arg Ile
  35                         725                    730                    735
        Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg Gln Asn
                            740                    745                    750
        Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile Ser Phe
                            755                    760                    765
  40    Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile
                            770                    775                    780
        Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln
        785                    790                    795                    800
        Asp Val Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr
  45                         805                    810                    815
        Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser
                            820                    825                    830
        Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile
                            835                    840                    845
  50    Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Leu Ala
                            850                    855                    860
        Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu
        865                    870                    875                    880
        Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys
  55                         885                    890                    895
        Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr
                            900                    905                    .910
        Arg Glu Gln Lys Phe Glu Tyr Met Tyr Ala Gln Ser Leu Gln Val Pro
                            915                    920                    925
  60    Tyr Arg Asn Ser Leu Arg Lys Ala His Ile Phe Gly Val Ser Phe Ser
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            930                     935                     940
    Ile Thr Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe
    945                     950                     955                 960
    Gly Ala Tyr Leu Val Ala Asn Glu Phe Met Asn Phe Gln Asp Val Leu
                    965                     970                     975
    Leu Val Phe Ser Ala Ile Val Phe Gly Ala Met Ala Val Gly Gln Val
                    980                     985                     990
    Ser Ser Phe Ala Pro Asp Tyr Ala Lys Ala Lys Val Ser Ala Ala His
                995                     1000                    1005
    Val Ile Met Ile Ile Glu Lys Ser Pro Leu Ile Asp Ser Tyr Ser Pro
        1010                    1015                    1020
    His Gly Leu Lys Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Asn Glu
    1025                    1030                    1035                1040
    Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln Gly
                    1045                    1050                    1055
    Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val Gly Ser
                    1060                    1065                    1070
    Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu Arg Phe Tyr
                    1075                    1080                    1085
    Asp Pro Leu Ala Gly Ser Val Leu Ile Asp Gly Lys Glu Ile Lys His
            1090                    1095                    1100
    Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly Ile Val Ser Gln Glu
    1105                    1110                    1115                1120
    Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp
                    1125                    1130                    1135
    Asn Ser Arg Val Val Ser His Glu Glu Ile Met Gln Ala Ala Lys Glu
                1140                    1145                    1150
    Ala Asn Ile His His Phe Ile Glu Thr Leu Pro Glu Lys Tyr Asn Thr
                1155                    1160                    1165
    Arg Val Gly Asp Lys Gly Thr Gln Leu Ser Gly Gly Gln Lys Gln Arg
        1170                    1175                    1180
    Ile Ala Ile Ala Arg Ala Leu Val Arg Gln Pro His Ile Leu Leu Leu
    1185                    1190        ·           1195                1200
    Asp Glu Ala Thr Ser Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln
                    1205                    1210                    1215
    Glu Ala Leu Asp Lys Ala Arg Glu Gly Arg Thr Cys Ile Val Ile Ala
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    His Arg Leu Ser Thr Ile Gln Asn Ala Asp Leu Ile Val Val Phe Gln
            1235                    1240                    1245
    Asn Gly Lys Val Lys Glu His Gly Thr His Gln Gln Leu Leu Ala Gln
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    Lys Gly Ile Tyr Phe Ser Met Ile Ser Val Gln Ala Gly Ala Lys Arg
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            20                  25                      30
    Ser Thr Val Arg Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val
            35                  40                      45
    Ile Val Glu Lys Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile
            50                  55                      60
    Tyr Phe Lys Leu Val Thr Met Gln Thr Arg Gly Asn Glu Ile Asp Leu
    65                  70                      75                  80
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Glu Asn Ala Thr Gly Glu Ser Lys Ser Glu Ser Asp Ala Leu Glu Met
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Ser Pro Lys Asp Ser Gly Ser Ser Leu Ile Lys Arg Arg Ser Thr Arg
            100                 105                 110
Arg Ser Ile His Ala Pro Gln Gly Gln Asp Arg Lys Leu Gly Thr Lys
        115                 120                 125
Glu Asp Leu Asn Glu Asn Val Pro Pro Val Ser Phe Trp Arg Ile Leu
        130                 135                 140
Lys Leu Asn Ser Thr Glu Trp Pro Tyr Phe Val Gly Ile Phe Cys
145                 150                 155                 160
Ala Ile Ile Asn Gly Gly Leu Gln Pro Ala Phe Ser Ile Ile Phe Ser
                165                 170                 175
Arg Ile Ile Gly Ile Phe Thr Arg Asp Glu Asp Pro Glu Thr Lys Arg
                180                 185                 190
Gln Ile Ser Asn Met Phe Ser Val Leu Phe Leu Val Leu Gly Ile Ile
            195                 200                 205
Ser Phe Ile Thr Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly
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Glu Ile Leu Thr Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu
225                 230                 235                 240
Arg Gln Asp Val Ser Trp Phe Asp Asp Leu Lys Asn Thr Thr Gly Ala
            245                 250                 255
Leu Thr Thr Arg Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile
            260                 265                 270
Gly Ser Arg Leu Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr
    275                 280                 285
Gly Ile Ile Ile Ser Leu Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu
    290                 295                 300
Leu Ala Ile Val Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys
305                 310                 315                 320
Met Leu Ser Gly Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala
            325                 330                 335
Gly Lys Ile Ala Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser
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